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Self-evaluation and peer-feedback of medical students' communication skills using a web-based video annotation system. Exploring content and specificity

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ABSTRACT

Objective: Self-evaluation and peer-feedback are important strategies within the reflective practice paradigm for the development and maintenance of professional competencies like medical communication. Characteristics of the self-evaluation and peer-feedback annotations of medical students' video recorded communication skills were analyzed.

Method: Twenty-five year 4 medical students recorded history-taking consultations with a simulated patient, uploaded the video to a web-based platform, marked and annotated positive and negative events. Peers reviewed the video and self-evaluations and provided feedback. Analyzed were the number of marked positive and negative annotations and the amount of text entered. Topics and specificity of the annotations were coded and analyzed qualitatively.

Results: Students annotated on average more negative than positive events. Additional peer-feedback was more often positive. Topics most often related to structuring the consultation. Students were most critical about their biomedical topics. Negative annotations were more specific than positive annotations. Self-evaluations were more specific than peer-feedback and both show a significant correlation. Four response patterns were detected that negatively bias specificity assessment ratings.

Conclusion: Teaching students to be more specific in their self-evaluations may be effective for receiving more specific peer-feedback.

Practice implications: Videofragmentrating is a convenient tool to implement reflective practice activities like self-evaluation and peer-feedback to the classroom in the teaching of clinical skills.

1. Introduction

Self-monitoring and self-regulation are important responsibilities of medical professionals in the development and maintenance of professional competencies [1,2]. Physicians are expected to be able to evaluate their own strengths, weaknesses and learning needs in order to maintain a level of competence in accordance with the professional norm [3]. The importance of concepts like reflection, self-assessment, peer-assessment, peer-feedback are intrinsically connected to the Professional and Scholar roles of the CanMeds model, which is nowadays the leading model underlying many medical curricula in the world [4,5].

Self-evaluation and peer-feedback are particularly relevant and have been proven to be effective in medical communication skills training because the problems to be solved in medical communication are 'ill defined' [6]. In ill-defined problems the given state, the goal state, and effective operations are not fully predefined and have several unique but equally correct solutions [7–9]. For example, Epstein et al. [10] found that physicians show different 'solutions' in responding to patients' expressions of worry (from most to least frequent): acknowledgement, inquiry, explanation, reassurance, empathy. Which of these responses is most appropriate requires appraisal of the context factors [11].

Self-evaluation and peer-feedback fit in the modern educational paradigm of reflective practice, a concept introduced by Donald Schön in 1983, which has gained popularity in recent years [12–14]. Reflective practice aims to develop critical thinking, problem-solving, and self-directed and lifelong learning skills through gaining new understandings, new perspectives, and new alternatives for future performance [12,15].

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Reflective practice does not come naturally to most students and requires formal educational arrangements [16]. Video-based learning using a web-based platform for sharing video recordings of clinical performance, which students and peers can review and comment on, can be helpful [17,18].

By reviewing their work and that of others, students develop their evaluative skills and acquire a better understanding of the performance criteria [14,19,20]. Combining internal information from self-evaluation with external information from (peer-)feedback is considered most effective to optimize clinical performance [21,22]. While some studies stress the importance of external feedback as input for informed self-assessment, others show that external feedback is more effective in response to student self-evaluations [21,22].

Assessment of the quality of self-evaluations and peer-feedback is often defined in terms of accuracy, consistency across assessors, or concordance with teacher feedback [23]. However, the concordance between student and expert evaluations is often vulnerable to bias for two reasons. First, for an individual it is difficult to make objective observations of his or her own performance due to unconscious biases [3]. Second, external evaluations among medical faculty often lack consensus by valuing different aspects of the performance [24,25].

A different approach defines quality of self-evaluations and peer-feedback in terms of content and/or style characteristics [23]. Students' ability to focus on content and style characteristics is generic and transferable to other settings. Self-evaluations and peer-feedback need to be specific to be effective [22,26,27]. Specificity is defined as the level of information presented in feedback messages [28]. Some studies rated specificity of reflections and feedback on three component levels, while others use five [22,23]. In a previous study among second year students we developed a system for coding self-evaluations, which includes three retrospective categories describing the event (behaviour) and its antecedents (motive) or consequences (effect), and two prospective categories describing an alternative strategy and its goal [29].

The aims of the present mixed method study are to explore quantitatively and qualitatively:

1. the characteristics of the self-evaluations and peer-feedback annotations of medical students' video recorded communication skills.
2. how the characteristics of the peer-feedback relate to the characteristics of the self-evaluations.
3. features that may bias the assessment of the specificity of the self-evaluations and peer-feedback.

2. Methods

2.1. Participants and procedure

In 2009–2010 the Bachelor-Master structure was introduced in the curriculum of the Academic Medical Centre of the University of Amsterdam, following the Bologna Process to harmonize the systems of higher education in Europe [30]. Every fourteen days a group of about 14 year 4 students is starting with their Master programme. In July and August 2012 two student groups were invited to use the VideoFragmentRating (VFR) system, embedded in a regular history-taking skills training programme preparing them for the clinical rotations in their clerkships [31].

All Master students were trained in the Bachelor programme on history-taking, the functions of nonverbal and verbal active listening skills, and the principles of effective feedback. History-taking skills were practiced in small group trainings with simulated patients: (1) relationship building; (2) gathering reliable biomedical information about the complaints; (3) asking about the patient's ideas, concerns and expectations; (4) structuring the consultation [32,33].

In the Master programme these principles were refreshed briefly in a plenary instruction, including the review and analysis of a demonstration video. Next, each student recorded individually a history-taking consultation with one of five available simulated patients for formative assessment. Videos were recorded with standalone handycams and uploaded in the VFR system.

VFR is a dedicated web-based application for review and annotation of video recording of clinical skills. In VFR the video and all markings and annotations are presented in a single screen. It is developed at the Department of Surgery of the University Medical Centre Groningen, The Netherlands. Students can upload their own video recording to the password protected video server. Based on the strict security requirements, only the student and the invited peers or supervisor are able to access and review the video recording and annotations of the student.

Students were instructed to review their video individually and to mark and annotate on the timeline two green bullets for successful performances and two red bullets for poor performances of the student (Fig. 1). Next, each student provided peer-feedback to a student who recorded a history-taking consultation with the same simulated patient as their own. Feedback annotations to the self-evaluations automatically have the same valence as selected by the student. Peers could also provide additional feedback by marking and annotating new events on the timeline. The valence of the additional feedback is decided by the peer.

2.2. VFR data extraction

Anonymized data were extracted from the log files of the VFR system. These data include per student the number of self-evaluations, the number of peer-feedback annotations, and the number of additional feedback annotations. Further is extracted the valence and the content of each annotation. The number of characters entered was computed for each annotation with the Microsoft Excel length (field) function.

2.3. Data coding

Content and specificity of annotations were coded in an iterative process by JV. The coding of the content was initially based on the criteria derived from the History Taking Assessment Scale (HTAS) which is used for formative and summative assessment of students in the Bachelor programme [33]. The initial coding structure was organized around the HTAS behavioural (sub)categories: courteousness and respect; asking for medical information; asking for ideas, concerns, expectations of the patient; structuring the conversation. In weekly meetings the codings of JV were discussed with RH, expanded and modified if required. Throughout the analyses differences in interpretation were resolved through discussion and re-examination of the annotations and codings. The coding scheme was developed by using MaxQDA software which is designed for qualitative and mixed methods data analysis [34].

The coding of the specificity of the annotations was based on a system developed in an earlier study [29]. Three retrospective categories relate to '*describing the key event*'; two prospective categories relate to '*finding new solutions*'. Box 1 provides a description of each category. Annotations containing more of these categories are considered more specific. Hence, the specificity score can range between 0 and 5.